

RESEARCH ARTICLE

Motivators, hygiene factors, and ethical considerations in job satisfaction: A study of Malaysian engineers post-pandemic

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ABSTRACT - The COVID-19 pandemic crisis impacted the global economy, forcing companies to adapt to the 'new normal' in their operation. Employee job satisfaction and well-being are affected by the pandemic. Using the Herzberg's motivation-hygiene theory, this study examines job satisfaction in the engineering industry post-COVID-19 pandemic. A survey of 220 employees from Malaysian engineering companies was analysed using the partial least squares approach. Our results show motivator factors (such as achievement, advancement, nature of work, and recognition) positively influenced job satisfaction. Salary was the only hygiene factor with a significant effect. The practical implications of our results emphasize the importance of fostering a supportive work environment to enhance employee satisfaction. Factors like advancement, company policies, work security, and conditions exhibited insignificant impact. These insights address the engineering industry's challenges post-COVID-19 pandemic and provide recommendations to enhance job motivation and satisfaction.

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1. INTRODUCTION

Companies want to retain their employees for the long term and offer them a plethora of opportunities with the goals of reducing turnover cost, enhancing the company culture, improving employee morale, building company reputation. However, employees have numerous expectations and demand that must be met. This study analyses the demands of employees and their job satisfaction, which ultimately help the company to achieve higher profits. Based on the literature, job satisfaction is recognised as a key determinant in reducing turnover intentions (Jamal et al., 2021). Indeed, job satisfaction plays a critical role in organizational functioning as it impacts not only employee turnover intentions but also job performance and overall organizational performance (Dorta-Afonso et al., 2021; Koh & Boo, 2001). Low motivation leads to low performance, which can reduce job satisfaction. Since job satisfaction is an important factor in organization performance, it helps to identify the factors that influence employee job satisfaction.

Engineering is an important sector that plays a critical role in developing countries such as Malaysia in fostering economic growth, advancing development, and enhancing living standards. Engineering can provide solutions to a broader industrial spectrum including transportation, medicine, space, automated technology, environment, and agriculture, etc. According to a report from Malaysia government, Malaysian manufacturing is of great economic importance, contributing approximately 24.3% of the country's GDP in 2021 (Performance, 2022). Of the 49,000 manufacturing companies in Malaysia, most are SMEs. Manufacturing sectors in Malaysia include the aerospace and electronics sectors. Electrical and electronics products are the largest single contributors to the manufacturing engineering of Malaysia (Malaysia, 2022). Thus, the engineering sector is demanding and plays an important role in driving Malaysia's economy.

In the post-COVID-19 pandemic era, employee job satisfaction has become significantly more important to companies (Rajah et al., 2023; Cheah et al, 2024), including the engineering industry. As this industry adjusts to new work environments and obstacles, it is critical to identify the motivators and hygiene factors that strongly influence employee job satisfaction. Understanding these factors is essential for companies to improve their approaches to attract, motivate, and retain qualified employees. This study examines the motivators and hygiene factors that impact employee job satisfaction within the engineering sector in the post- COVID-19 pandemic era and provides valuable insights for optimizing companies' human resource management practices. By examining the impact of motivators and hygiene factors on employee job satisfaction, organizations can develop comprehensive and effective employee satisfaction strategies that encompass all relevant aspects of the work environment. In short, this study addresses two main objectives, first, to examine the motivator factors that have a positive impact on employee's job satisfaction and the hygiene factors that have a positive impact on employee's job satisfaction in post- COVID-19 pandemic era in engineering industry. Our findings indicate that the main drivers of job satisfaction are achievement, the intrinsic nature of the work, and recognition. These factors are central to motivating employees and fostering a sense of fulfilment in their roles. The study's findings enhance our comprehension of the shifts in factors influencing job satisfaction, reflecting changes in people's lifestyles because of the pandemic.

2. LITERATURE REVIEW

Table 1 summarises several quantitative studies on the relationships between motivation and job satisfaction. The studies were conducted in several industries including academia, hotel, hospital nursing and retail. Overall, Table 1 indicates that motivators and hygiene factors have a positive relationship with job satisfaction. The table also highlights the importance of employees' basic needs such as salary, which can reduce the dissatisfaction of employees. Second, previous empirical results also show an inconsistent correlation between motivation and job satisfaction. Some research results show that motivators have a positive impact on job satisfaction (Ayalew et al., 2021), but it was insignificant (Tan, 2011). Moreover, the factors affecting job satisfaction might change due to the significant impact of the COVID-19 pandemic on people's lifestyles and welfare.

Table 1. Summary of core literature on motivation and job satisfaction

Author	Country and respondents	Main Findings/Results
Sobaih & Hasanein (2020)	Egypt; 256 valid responses from the first line customer support, housekeeping, and kitchen staff.	Intrinsic factor positively affects job satisfaction while motivators negatively affect job satisfaction.
Tan & Waheed (2011)	Malaysia; 152 valid responses from salespeople from the retail industry	Working conditions were the most significant in motivating sales personnel. Recognition was second, followed by company policy and salary. Financial incentives were significant motivators of sales staff.
Ayalew et al., (2021)	Northwest Ethiopia; 178 valid responses from nurses working in a hospital.	Intrinsic factors influencing job satisfaction among nurses working in Amhara state, Northwest Ethiopia. Achievement and recognition at work is most significant in motivating nurse for their job satisfaction
Lee et al., (2022)	Korea; 355,199 data collected between 2014 and 2021 from nine different employment sectors	Motivation factor such as promotion opportunities and probability are positive and significant to job satisfaction. Hygiene factors including salary compensation, well-being, culture of company and, leadership have a positive and significance effect on job satisfaction.
Cristina-Corina (2012)	Romanian; 201 valid responses from teachers in primary, secondary, and college schools.	Teachers are more motivated by motivator factors rather than hygiene factors.

2.1 Herzberg's Motivator Hygiene Factor Theory

Various theories have been proposed to understand motivation and job satisfaction such as the Job Characteristic Model, Self-Determination Theory, and Herzberg's Motivator Hygiene theory (Lee, 2016; Blanz, 2017; Ali, 2014; Akosile, 2022; Ayalew et al., 2021). One of the theories is Herzberg's Motivator Hygiene factor theory. In his study, Herzberg surveyed 200 engineers and accountants and found that employees' positive feelings were related to the job content itself, including achievement, recognition, advancement, and the work. Conversely, negative feelings were associated with the context of the job, particularly external factors, also known as hygiene factors, such as salary, working conditions, and company policies (Ayalew et al., 2021; Herzberg, 1966; Sobaih & Hasanein, 2020). Motivations factors are associated with the employee performance and encompasses the intrinsic aspect of work which includes advancement recognition, work itself, and achievement (Cheah et al., 2018; Sobaih & Hasanein, 2020). These factors may lead to employee satisfaction in their work (Sobaih & Hasanein, 2020; Ayalew et al., 2021). These motivation factors are also referred to as intrinsic motivation. In addition, there are hygiene factors, known as extrinsic motivation. These are related to the environment that reflect external rewards or punishments such as salary, company policies, work security, and working conditions.

Herzberg's research has played a substantial role in defining and clarifying the concept of job satisfaction. Herzberg's theory has been extensively studied in modern times (Alrawahi et al., 2020; Lee et al., 2022; Ruthankoon & Olu Ogunlana, 2003; Sobaih & Hasanein, 2020; Tan & Waheed, 2011). Therefore, we use this theory to examine the job satisfaction levels of employees working in the post- COVID-19 pandemic engineering industry. Tan & Waheed (2011) test the motivator-hygiene theory on retailers conclude that motivation factor has lower effect on job satisfaction than hygiene factors. The results revealed only one motivating factor such as recognition with a positive effect on employee job satisfaction, but there are three hygiene factors such as salary, company policy, and working conditions with a positive effect on employee job satisfaction. Another study examined job satisfaction in Thai construction sector using the motivator-hygiene hypothesis and found Herzberg's theory is entirely applicable (Ruthankoon & Olu Ogunlana, 2003). The motivation factors that positively affect to job satisfaction are achievement, responsibility, and growth opportunities.

The hygiene factors that have positive impact on job satisfaction are company policy, interpersonal relationships with supervisors, salary, and interpersonal relationships with peers.

A study conducted by Sobaih (2020) examined the applicability of the motivator-hygiene theory in employees of a five-star hotel. The study found that motivation factors had a negative impact on job satisfaction. However, hygiene factors had a positive effect on job satisfaction. These findings show that the motivator-hygiene theory is not applied to all organizations and employees. Ayale et al (2021) found that health, high work volume, money, advancement, recognition, and company policies were causes of job dissatisfaction. Further, the study discovered that factors such as relationship with peers and supervisor, and career advancement have impact on job satisfaction.

2.2 Job Satisfaction

Job satisfaction is defined as employee satisfaction with various work-related factors. Higher levels of job satisfaction are often associated with happiness at work (Seema et al., 2021). Job satisfaction is also defined as individual's cognitive, affective, and evaluation response to his or her work (Locke, 1969; Seema et al., 2021). Locke proposed that job satisfaction encompasses a pleasurable emotional condition arising from the fulfilment of one's job values, whereas job dissatisfaction entails an unpleasant emotional state stemming from the thwarting of one's job values (Locke, 1969). Previous research has consistently highlighted the importance of job satisfaction as a critical determinant in predicting employee turnover (De Sousa Sabbagha et al., 2018) and subjects in organizational psychology (Riggio, 2017; Sobaih & Hasanein, 2020). Research has shown that teachers have the lowest job satisfaction because the factors such as compensation, advancement prospects, the relationship with the supervisor and the responsibility given to them by the organization are below their expectations (Al'Abri et al., 2022). Maintaining high job satisfaction among employees is critical for achieving optimal organizational performance (Sabbagha et al., 2018).

Job satisfaction is important for employee well-being. A person's level of psychological well-being can influence their ability to cope with the obstacles at work, which in turn can affect their level of job satisfaction (Natalie Jones, 2015). Job satisfaction encompasses a multidimensional psychological response to one's work. Studies have defined job satisfaction as an employee's feelings, perspectives, and personality traits toward his or her work (Hulin & Judge, 2003). Employees with high level job satisfaction tend to love their work, feel that their job are fair, and believe that their responsibilities are challenging and come with adequate compensation and security, etc.

Employment satisfaction is the result of a mix of physiological and psychological elements that cause a person to be content with his or her job (Al-maaitah et al., 2021 & Almaaitah, 2021; Hoppock, 1935). Job satisfaction comprises a collection of both favourable and unfavourable emotions and sentiments expressed towards one's employment. Job satisfaction can also provide information about how effectively individuals perceive their role in the organization (Al-maaitah et al., 2021). When employees have higher job satisfaction, they are more likely to work well and stay longer with the company. In this case, higher job satisfaction has a positive impact on the organization or company, such as high employee retention, cost efficiency for the company, higher productivity, and stronger employee loyalty that contributes to the spread of goodwill (Villanova, 2022).

Job satisfaction is widely recognized in the organizational literature as a critical factor in organizational success (Sobaih & Hasanein, 2020). Numerous studies have examined how to improve employee job satisfaction in various industries such as retail industry (Tan & Waheed, 2011), hospitality (Sobaih & Hasanein, 2020), and academia (Al'Abri et al., 2022; Cristina-Corina, 2012). However, there is limited research on examining job satisfaction in the engineering industry using Herzberg's motivation-hygiene theory in the post-COVID-19 pandemic era.

2.3 Motivation and Job Satisfaction

Motivation is important in success by empowering an organization's employees to achieve both their personal and organizational goals. Previous research has shown that motivation is a process that satisfies individual needs. When a person's needs are satisfied, he or she feels motivated and exerts effort toward his or her work performance. Herzberg proposed a comprehensive theory of motivation in which he emphasized two motivation factors: Motivators and Hygiene factors (Herzberg et al., 1959). Motivators, also referred as intrinsic factors, including achievement, recognition, the nature of the work itself, advancement opportunities, and personal growth. Hygiene factors refer to extrinsic factors, which include company policies, interpersonal relationships with peers, job security, supervisory support, salary, and working conditions.

According to Herzberg's theory, hygiene factors primarily contribute to dissatisfaction, while motivators are associated with increased motivation. Intrinsic motivation thrives in the presence of motivators, while the absence of hygiene factors tends to diminish motivation. This can be attributed to employees' expectations, as hygiene factors such as salary and benefits are considered basic requirements. When these factors are met, they do not significantly increase motivation, but their absence can lead to dissatisfaction. Conversely, motivators have the potential to act as a catalyst for additional motivation when they are present.

To improve employee satisfaction, managers should focus on encouraging personal growth, offering increased responsibility, and facilitating self-realization. Conversely, managers who want to reduce dissatisfaction, they should prioritize improvements in working conditions, policies and rules, supervision, and salary considerations.

2.4 Achievement and Job Satisfaction

Achievement refers to an employee's ability to complete a difficult task on time, solve a job-related problem and achieve goals. In the context of Herzberg's Two-Factor Theory, achievement is considered a motivator factor that directly contributes to job satisfaction. According to the theory, employees are motivated by factors such as personal growth, recognition, and the sense of accomplishment derived from their work. When employees can achieve challenging tasks and meet their goals, it fosters a positive sense of fulfilment and satisfaction in their job. High achievement can lead to employee success and job satisfaction (Metz, 2018). In a previous study it showed that achievement is a motivating factor for job satisfaction (Ayalew et al., 2021; Cheah et al., 2023). In another study, conducted in an audit firm, the researchers found that achievement has a negative impact on job satisfaction (Rani et al., 2018). This leads to our first hypothesis:

Hypothesis 1. Achievement has a positive effect on job satisfaction.

2.5 Advancement and Job Satisfaction

Advancement is defined as an opportunity to be promoted or get higher job status with more responsibilities in the organization. Advancement can prevent employee turnover. In the context of Herzberg's Two-Factor Theory, advancement can be considered a motivator factor that directly contributes to job satisfaction. The theory suggests that opportunities for growth, achievement, and recognition are key factors that promote employee satisfaction and motivation. Advancement provides employees with a sense of progress and development in their careers, enabling them to experience a higher level of job satisfaction. Many researchers have studied the relationship between opportunities for advancement and job satisfaction. From previous research in the hotel industry, advancement is the most important among the five categories of the job descriptive index, payment attained the highest score, followed by promotion or advancement, supervision, co-workers, and work itself (Tutuncu & Kozak, 2007). In addition, the hygiene factor, especially the opportunity for advancement was an important goal expected by the employees when working in the hotel industry (Ashton, 2018). In previous study by Ayalew et al., (2021) found that advancement was a motivator factor for job satisfaction. This leads to our second hypothesis:

Hypothesis 2. Advancement has a positive effect on job satisfaction.

2.6 Work itself and Job Satisfaction

The nature of the work itself plays a significant role in shaping employees' job satisfaction. The specific tasks and responsibilities assigned to employees have the potential to create either a positive or negative impact on their overall satisfaction. There are a few categories of the work tasks such as interesting, challenging, easy and boring (Ruthankoon & Olu Ogunlana, 2003). Wiley (1997) shows that interesting work is a motivating factor that increases job satisfaction. Likewise, work itself is a motivator factor for job satisfaction (Ayalew et al., 2021). Challenging tasks provide opportunities for employees to utilize their skills and expertise, enabling them to experience a sense of achievement and mastery. Overcoming obstacles and achieving success in challenging work tasks fosters a sense of personal accomplishment and satisfaction, ultimately contributing to overall job satisfaction. The positive relationship between work itself and job satisfaction is supported by Herzberg's Two-Factor Theory. According to the theory, the presence of motivating factors, such as interesting and challenging work, is essential for promoting job satisfaction. These factors address employees' higher-level needs for growth, achievement, and self-fulfilment, serving as intrinsic motivators that enhance job satisfaction and engagement. This leads to our third hypothesis:

Hypothesis 3. Work itself has a positive effect on job satisfaction.

2.7 Recognition and Job Satisfaction

Recognition is referred to as honour, praise or reward from a supervisor or manager because the employee delivers highly effective productivity. Research shows that giving recognition can lead to job satisfaction compared to monetary benefits (Tirta & Enrika, 2020). This explains that recognition is significance to job satisfaction. Ayalew et al. (2021) found that recognition serves as a motivating factor in job satisfaction. However, no research claims insignificant relationship of recognition to job satisfaction (Rani et al., 2018). These mixed findings highlight the importance of considering various factors such as organizational culture, individual preferences, and specific job roles when examining the relationship between recognition and job satisfaction. This leads to our fourth hypothesis:

Hypothesis 4. Recognition has a positive effect on job satisfaction.

2.8 Company Policies and Job Satisfaction

Company policies play a critical role in influencing employee job satisfaction. Whether a company has good or bad policies can have a significant impact on employees' satisfaction or dissatisfaction with their jobs (Ruthankoon & Olu Ogunlana, 2003). Company policies plays an important role in job satisfaction. For example, working from home, and paternity leave are good policies for employees (Tirta & Enrika, 2020). These policies provide employees with greater flexibility and autonomy in managing their work and personal responsibilities, ultimately leading to higher levels of satisfaction and engagement in their jobs. This leads to our fifth hypothesis:

Hypothesis 5. Company policies has a positive effect on job satisfaction.

2.9 Work security and Job Satisfaction

According to Spector (1997), working condition has an adverse effect on employee performance. A good working environment makes employees feel safe and may increase their commitment to the work. As a result, this benefits the organization. Work security is a hygiene factor that motivates employees to work in secure environment with sufficient income. A research conducted in the pharmaceutical companies in Bangladesh shows that work security is an important antidote in job satisfaction (Kabir & Parvin, 2011). (Islam & Zaki Hj. Ismail, 2008). By recognizing the importance of work security within the framework of Herzberg's theory, organizations can create a comprehensive approach to foster employee job satisfaction. Ensuring a secure work environment, promoting job stability, and providing fair and competitive compensation are critical components of meeting employees' basic needs and preventing dissatisfaction. This leads to our sixth hypothesis:

Hypothesis 6. Work security environment has a positive effect on job satisfaction.

2.10 Salary and Job Satisfaction

Salaries including monthly wages, incentives and bonus pay to employees are a return for the employees' contribution to their daily job. Research has indicated that salary is a crucially important factor affecting employee job satisfaction. According to previous research, salary and job satisfaction are significantly correlated (Tan & Waheed, 2011). Besides this, satisfaction with salary may reflect on age group, income level, and career stages (Rani et al., 2018; Tan & Waheed, 2011). Herzberg's theory highlights that motivator such as challenging work, recognition, growth opportunities, and achievement play a more substantial role in enhancing job satisfaction and intrinsic motivation. However, the positive impact of salary on job satisfaction cannot be understated, as it serves as a foundational element in meeting employees' basic needs and providing a sense of stability and fairness. This leads to seventh hypothesis:

Hypothesis 7. Salary has a positive effect on job satisfaction.

2.11 Working Conditions and Job Satisfaction

In the context of working conditions, Herzberg's theory suggests that the presence of favourable working conditions can be considered as a hygiene factor. Ensuring a comfortable and safe working environment, providing necessary resources and equipment, and addressing workload concerns are essential for preventing dissatisfaction among employees. Working conditions refer to the environment and conditions of the workplace whether good or bad, and the security sense. Workload, workspace, ventilation, equipment, temperature, and safety are all factors that affect the working environment (Khan et al., 2012). Toropova (2021) found that school working condition play a significant role on teacher job satisfaction (Toropova et al., 2021). Therefore, ensuring favourable working conditions is crucial for promoting job satisfaction and organizational success. By prioritizing the improvement of working conditions, organizations can create an environment that fosters employee well-being, engagement, and satisfaction. This leads to our eighth hypothesis:

Hypothesis 8. Working conditions has a positive effect on job satisfaction.

Figure 1 presents the research model and an overview of the hypothesis development.

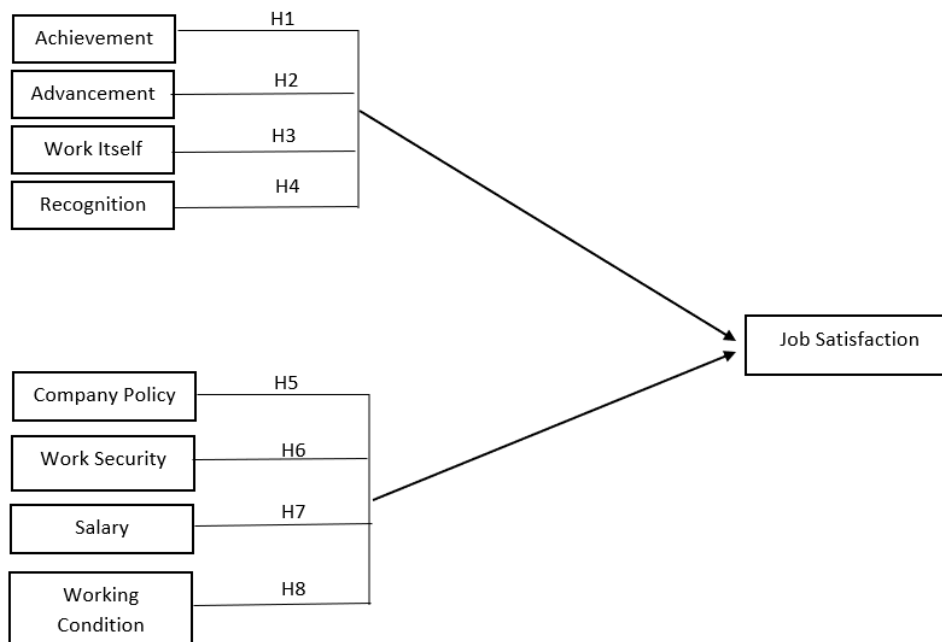


Figure 1. The model of research and overview of hypothesis development

3. METHODOLOGY

This study employs a survey questionnaire to collect the data and the Partial Least Squares (PLS) method, a structural equation modelling (SEM) method to analyse the data.

3.1 Research Constructs, Dimensions, and Measurement Items

Job satisfaction is our dependent variable, and motivating factors and hygiene factors are independent variables. Motivation factors are measured in four dimensions, namely achievement, advancement, work itself and recognition, whereas hygiene factors are measured by assessing company policy, work security, salary, and working condition (Tan & Waheed, 2011). The job satisfaction questionnaire items were adopted from Kim et al., (2018). There are three items scaled to assess job satisfaction. For example, “Overall, I am satisfied with my job”, “I feel comfortable with my job”, “I think my role of job is important”. Item scales are shown in Table 2. Responses are measured on a 7-point scale (1=strongly disagree to 7=strongly agree). Table 2 displays the research constructs and items.

Table 2. Research construct and item

A) Motivators (Tan & Waheed, 2011)	
a) Achievement	
AC1	I am proud to work in this company because it recognises my achievements
AC2	I feel satisfied with my job because it gives me a feeling of accomplishment.
AC3	I feel I have contributed towards my company in a positive manner
b) Advancement	
AD1	I choose career advancement rather than monetary incentives
AD2	My job allows me to learn new skills for career advancement
c) Work Itself	
WI1	My work is exciting, and I have a lot of variety in tasks that I do
WI2	I am empowered enough to do my job
WI3	My job is challenging and exciting
d) Recognition	
REC1	I feel appreciated when I achieved or completed the task
REC2	My manager always thanks me for a job well done
REC3	I received adequate recognition for doing my job well
B) Hygiene (Tan & Waheed, 2011)	
a) Company Policy	
CP1	I am proud to work for this company because my company policy is favourable for workers
CP2	I completely understand the mission of my company
b) Work Security	
WS1	I believe safe at my workplace
WS2	I believe my job is secure
WS3	My workplace is located an area where I feel comfortable
c) Salary	
SLR1	I am encouraged to work harder because of my salary
SLR2	I believe my salary is fair
d) Working Conditions	
WC1	I feel satisfied because of the comfort I am provide at work
WC2	I am proud to work for my company because of the pleasant working conditions
D) Job Satisfaction (Kim et al., 2018)	
JS1	Overall, I am satisfied with my job
JS2	I feel comfortable with my job
JS3	I think my role on my job is important

3.2 Research Populations and Sampling Method

This study chooses the engineering industry which has the best performance in Malaysia’s economy, contributing significantly to its growth and development. The list of engineering companies is obtained via a formal database of Institution of Engineers Malaysia. Using convenience sampling, the online questionnaire is set up in Google online form and distributed through connections through WhatsApp, emails, and social media platforms in the engineering groups.

After a week, a reminder message was sent to the respondents who have not responded to increase the response rate. Data was gathered over the two months, from March to April 2023. There were a total of 256 responses and 220 were valid generating a useable rate of 86 percent. To ensure that only target respondents are included in the study, we filtered questions such as "Are you currently employed in the engineering sector?"

In this study, the focus of analysis is on employees within Malaysia's engineering industry. The minimum sample size was determined using the G power calculator. The operational dependent variable incorporates 11 predictors, as outlined in the conceptual model depicted in Figure 1. To attain a power of 0.80, a minimum of 178 respondents is required (Hair et al., 2019). The study received 220 valid responses, surpassing the necessary minimum.

3.3 Respondent Profile

Table 3 presents demographic profile of the surveyed respondents. The result shows that 73% of the respondents are in the age group of 20-29 years, while 23% of the respondents were 20 years old. Furthermore, 44% of respondents are 30-39 years old, 20% between 40-49 years old, and 3% between 50-59 years old. In terms of gender, 50% of the respondents are female, 50% of are male. With regards to education, 86% have a university degree, 2% have a diploma and 12% have a master's degree. Approximately 59.5% of the respondents were married, and 40.25% are single. In addition, 4.09% of the respondents have an income of RM3000 and below, 24.10% income range between RM3001-RM5000, 16.80% with income between RM5001-RM7000, and 13.20% with income between RM7001-RM9000. The result shows 41.80% of the respondents did not provide responses regarding their income. This may be because of sensitivity and privacy concerns as they may feel uncomfortable disclosing their income information.

Table 3. Respondents profile

Variables	n	%
Gender		
Male	110	50
Female	110	50
Age		
20-29	73	33
30-39	96	44
40-49	44	20
50-59	7	3
Education		
Diploma	4	2
Bachelor	189	86
Postgraduate	27	12
Marriage status		
Single	131	59.5
Married	89	40.5
Income Range		
RM3000 and below	9	4.09
RM3001-RM5000	53	24.10
RM5001-RM7000	37	16.80
RM7001-RM9000	29	13.20
N/A	92	41.80

3.4 Validation and Reliability

The determination of instrumental exhibits' quality depends on the soundness and consistency of construct measurement, assessed through three criteria: internal consistency, convergent validity, and discriminant validity. First, the indicator's reliability is tested by analysing the outer loading in all variables. The average variance extracted (AVE) of all constructs is more than 0.5, and the outer loading of their indicator is higher than 0.7 (Hair et al., 2019). For the construct of Advancement, 1 item out of 2 has outer loading of 0.691 which is less than 0.708. However, a value of 0.6 or above is considered acceptable for exploratory research (Hulland, 1999). The construct's reliability and validity are accessed through AVE where all the construct returned with AVE higher than 0.5 (see Table 4).

Another element to evaluate the construct's validity is the Composite Reliability. The result shows all variables exhibited values well above the minimum threshold and are higher than 0.6, ranging from 0.798 to 0.938 (see Table 4). Table 4 displays a composite reliability result that is higher than the minimal criteria of 0.6 and ranges from 0.798 to 0.938. Next, the discriminant validity of the constructs was evaluated analysing the heterotrait-monotrait ratio (HTMT) of correlations. Table 5 shows the HTMT values of all constructs are under the conservative threshold of 0.85, demonstrating satisfactory discriminant validity.

Table 4. Validation and reliability measures of indicators

Indicator	Convergent Validity		Internal Consistency
	Outer Loadings (>0.7)	AVE (>0.5)	CR Rho_c (>0.7)
A) Motivators			
AC1	0.884	0.747	0.898
AC2	0.899		
AC3	0.807		
AD1	0.691	0.669	0.798
AD2	0.928		
WI1	0.842	0.713	0.882
WI2	0.817		
WI3	0.874		
REC1	0.879	0.783	0.915
REC2	0.903		
REC3	0.871		
B) Hygiene			
CP1	0.829	0.714	0.882
CP2	0.884		
CP3	0.820		
b) Work Security			
WS1	0.885	0.880	0.898
WS2	0.847		
WS3	0.859		
SLR1	0.922	0.853	0.921
SLR2	0.925		
d) Working Conditions			
WC1	0.933	0.747	0.936
WC2	0.943		
D) Job Satisfaction			
JS1	0.941	0.836	0.938
JS2	0.936		
JS3	0.863		

Note: AVE = Average variance extracted; CR= Composite reliability

Table 5. Heterotrait-Monotrait ratio (HTMT) of correlations

	ACH	ADV	CP	JS	REC	SLR	WC	WI
ADV	0.730							
CP	0.692	0.684						
JS	0.696	0.689	0.678					
REC	0.568	0.612	0.658	0.753				
SLR	0.575	0.633	0.612	0.727	0.587			
WC	0.611	0.619	0.664	0.727	0.726	0.684		
WI	0.738	0.768	0.555	0.742	0.658	0.618	0.563	
WS	0.622	0.761	0.735	0.672	0.646	0.627	0.752	0.514

Note: ACH = Achievement; ADV = Advancement; CP= Company policy; JS= Job satisfaction; REC = recognition; SLR= Salary; WC= Working condition; WI= working itself; WS= Working security.

4. RESULTS AND DISCUSSION

Table 6 shows that out of the eight motivational variables examined, only four exhibited statistical significance in the Malaysia's engineering industry. The result reveals that salary is the most influential variable on job satisfaction. Achievement is the second significant factor, followed by work itself and recognition. There is only one significant

hygiene factor, while 3 out of 4 motivators are significant. The results show that motivator factors are more effective than hygiene factors in motivating employees working in engineering companies.

Table 6. Summary of hypothesis test results

Hypothesis	Relationship	t-value (T>1.65)	p-value (p<0.05)	Confidence Intervals 5%;95%	Supported (+/+ or -/-)
H1	ACH → JS	2.163	0.015	0.045;0.261	Yes
H2	ADV → JS	0.094	0.463	-0.11;0.131	No
H3	WI → JS	1.786	0.037	0.043;0.371	Yes
H4	REC → JS	1.732	0.042	0.06;0.256	Yes
H5	CP → JS	0.579	0.281	-0.094;0.164	No
H6	WS → JS	0.229	0.409	-0.105;0.142	No
H7	SLR → JS	3.306	0.000	0.144;0.330	Yes
H8	WC → JS	0.594	0.276	-0.06;0.167	No

Hypothesis (H1) hypothesizes that achievement positively affects job satisfaction. The result demonstrates that achievement is positively correlated with job satisfaction (see Table 6). Thus (H1) is supported. However, hypothesis (H2) is not supported. This means that advancement does not affect job motivation. Hypothesis (H3) hypothesizes that work itself positively affects job satisfaction. The results show that the relationship between work itself and job satisfaction is positive and statistically significant (p=0.037). The positive relationship between work itself and job satisfaction is supported by Herzberg's Two-Factor Theory. According to the theory, the presence of motivator factors, such as interesting and challenging work, is essential for promoting job satisfaction. These factors address employees' higher-level needs for growth, achievement, and self-fulfilment, serving as intrinsic motivators that enhance job satisfaction and engagement. Likewise, there is a positive relationship between recognition and job satisfaction. The finding confirmed hypothesis (H4). Thus, job satisfaction is favourably impacted by recognition.

Hypothesis (H5) states that company policies positively affect job satisfaction. However, our result does not support H5. This means that company policies did not affect job motivation. Hypothesis (H6) states that the work security positively affects job satisfaction. Based on the result H6 is not supported. Hypothesis (H7) hypothesizes that salary positively affects job satisfaction. The result demonstrates the existence of a favourable and significant relationship between pay and job satisfaction. This H7 is supported, and salary has a positive effect on job satisfaction. Next, the hypothesis H8 states that the working conditions positively affects job satisfaction. However, our result does not support H8. This means that work conditions did not affect job motivation.

This study identifies the motivation factors that contribute to job satisfaction accordance with Herzberg's theory in post COVID-19 pandemic. There have been major changes in working conditions, job security, and work-life balance as a result of the pandemic, which have affected many people (Amran et al, 2023). It is important to determine which category of motivating or hygiene factors have a greater influence on employee job satisfaction in the post COVID-19 pandemic era. This enables policy makers to design strategies to improve employee motivation and job satisfaction. Based on the results, hypotheses H1, H3, H4, and H7 are consistent with the proposed research hypotheses, indicating a positive relationship between achievement, work itself, recognition, salary, and job satisfaction. However, the hypotheses H2, H5, H6, and H8 are not supported and do not align with the findings reported in the literature.

H1 reveals a positive relationship between achievement and job satisfaction. Therefore, employees are more likely to be motivated and satisfied with their professions if they have a feeling of accomplishment and are assigned difficult tasks that they can do. This result aligns with Herzberg's motivator factor theory, which emphasizes the significance of a sense of achievement in employee motivation and job satisfaction. According to Herzberg's theory, achievement is considered a motivating factor that directly influences job satisfaction. When employees are given opportunities to accomplish meaningful tasks and are recognized for their achievements, it enhances their overall satisfaction with their work. The result aligns with previous research which reported that achievement can motivate employee job satisfaction (Ruthankoon & Olu Ogunlana, 2003; Ayalew et al., 2021). The findings across different studies reinforces the notion that achievement plays a crucial role in fostering job satisfaction among employees.

H2 shows that advancement does not satisfy employee's job satisfaction. The results of this study contradict the studies of (Ayalew et al., 2021; Ruthankoon & Olu Ogunlana, 2003). These conflicting results suggest that the availability of advancement opportunities may have different effects on job satisfaction depending on various factors such as industry, organizational culture, or individual expectations. Thus, we can conclude that the lack of advancement opportunities may dissatisfy employees. Mismatched expectation may lead to a sense of disappointment and reduce satisfaction. When employees feel that there is no clear career path to advancement, they may feel unfulfilled and undervalued. Spector (1997) states the importance of career advancement as a key factor in job satisfaction. If employees who perceive a lack of opportunities for advancement are more likely to become dissatisfied with their jobs. The discrepancy between our study's findings and earlier research underscores the complexity of the relationship between advancement and job satisfaction. It suggests that contextual factors, such as the specific organizational context or the individual's career

expectations, can influence the impact of advancement opportunities on job satisfaction. Therefore, organizations should carefully consider the career development paths and advancement opportunities they offer to employees to ensure that they align with employees' expectations and aspirations.

H3 shows a positive relationship between work itself and job satisfaction. This suggests that employees who find meaning and purpose in their work are more likely to be satisfied with their job. Meaningful work that contributes to a larger purpose or societal impact can provide a sense of fulfilment. When individuals believe their work makes a difference or serves a greater good, it enhances their job satisfaction. This finding is consistent with research which identified work itself as the most significant factor in job satisfaction (Ayalew et al., 2021; Smerek & Peterson, 2007).

H4 shows that recognition positively affects job satisfaction suggests that workers are more willing to be motivated and be productive employees if they are complimented and given credit for their contributions. This result is consistent with Herzberg's motivating factor and in line with previous studies. The recognition of employees' work inputs is also a manifestation of Maslow's self-esteem requirement, which is deemed as a significant factor influencing their overall job satisfaction (Lee et al., 2015). Recognizing employees for their contributions and providing them with positive feedback and appreciation aligns with Herzberg's motivator factor theory and fulfils employees' self-esteem needs. By incorporating recognition practices into their organizational culture, companies can create a more satisfying work environment, enhance employee motivation, and foster a sense of value and belonging among their workforces.

The result of H5 contradicts the results of previous studies. Previous research show that favourable policies with performance have a positive impact on job satisfaction. Our result shows that company policies dissatisfy employees if they are perceived as unfair or not in line with employee expectations or needs. If policies are not communicated or delivered this may lead to frustration and dissatisfaction among employees. In the post COVID-19 pandemic, health and safety policies have become more critical. Employees expect their organization to have well defined protocols in place to ensure a safe working environment. For example, sanitization practices, social distancing guidelines and remote option can contribute to employee's peace of mind and job satisfaction. The pandemic has accelerated the adoption of flexible work arrangement such as remote work or hybrid models. Employee values the flexibility to manage their work and personal live effectively. Companies that have policies supporting flexible work arrangement and work-life balance are likely to enhance job satisfaction (de Lucas Ancillo et al., 2021). Therefore, companies need to review and communicate their policies to ensure the policies are fair, clear, and meet the needs of their employees.

The results of H6 and H8 also contradicts the results of previous studies. Previous research found that high work security and good working condition will lead to higher job satisfaction (Islam & Zaki Hj. Ismail, 2008). The findings of this study indicate low work security and working conditions negatively affect job satisfaction. Employees are currently facing decreased job security due to the impact of the COVID-19 pandemic, which has resulted in an economic crisis and widespread layoff (El Khawli, 2022). In addition, employees who work in uncomfortable or unsafe environments may feel unsupported, which can lead to lower job satisfaction. A significant change in the working condition can potentially impact job satisfaction. For example, during the pandemic, many employees were required to work from home for an extended period. The transition from working remotely to returning to the office after a two-year period can potentially generate dissatisfaction among employees due to the change in working mode. The shift in the working environment has the potential to disrupt established routines and expectations, leading to discomfort and reduced job satisfaction. According to a survey conducted by Owl Labs (2020), half of Americans now view working remotely as essential for their job satisfaction. Additionally, Robinson (2022) revealed that 77% of the respondents in his study expressed happiness and job satisfaction when given the opportunity to work remotely after the COVID-19 pandemic.

The result of H7 shows a significant influence of salary on employee job satisfaction across various industries (Jung & Yoon, 2015; Tan & Waheed, 2011). Salary provides employee with financial necessary to meet their basic needs to supports himself and his family and achieve a certain level of financial security. When employees are satisfied with their salary, they tend to display a positive attitude towards their job. Therefore, companies must establish an appropriate payment range for their employees. As salary plays a significant role in influencing employee job satisfaction, organizations and managers must ensure that they provide a competitive salary range to enhance job satisfaction in the Malaysian engineering companies.

5. CONCLUSIONS

According to Herzberg's motivator-hygiene theory, motivating factors help employees feel satisfied while hygiene factors prevent job dissatisfaction. The theory has been empirically tested in our study in the Malaysian engineering industry. Our results show that achievement, the work itself, and recognition are the primary motivators contributing to job satisfaction, while salary is the only hygiene factor that leads to satisfaction. These findings are consistent with previous studies, indicating that the motivator-hygiene theory remains relevant in the post-COVID-19 pandemic era. The motivating factor such as advancement has a negative relationship towards job satisfaction. It is worth noting that the pandemic has significantly impacted the Malaysian engineering industry, with many employees experiencing changes in work conditions, job security, and company policies during COVID-19 pandemic (Cheng & Kao, 2022). The hygiene factors may have altered the relative importance of motivators and in influencing job satisfaction. However, salary remains a crucial factor in motivating employees in the Malaysian engineering industry. Our results confirm the importance of salary in enhancing employee motivation and job satisfaction in the Malaysian engineering industry. By

embracing these proactive measures, managers can create a positive work environment that acknowledges the importance of both motivators and hygiene factors, while also addressing the unique challenges posed by the COVID-19 pandemic. These measures not only contribute to the well-being and satisfaction of employees but will also promote resilience and success within the engineering industry as it continues to navigate the post-pandemic landscape.

5.1 Contribution and Implication for Theory and Practice

This study contributes to theoretical gaps in the literature by addressing the ambiguous relationships between job satisfaction and hygiene variables as well as the uneven association between motivational factors and job happiness in the post-COVID-19 pandemic era. The study findings improve our understanding of how factors influencing job satisfaction may have changed due to the impact of the pandemic on people's lifestyles. The finding of our study confirms that the direct effects still exist between motivator achievement, work itself, and recognition towards job satisfaction during the post-COVID-19 pandemic era. The direct relationships confirmed that salary has a positive significant effect on job satisfaction. The results should be useful to academics and researchers looking to apply Herzberg's theory to the engineering sector. For practical contributions, the result of this study may provide valuable insights for industry practitioners who seek to increase employee job satisfaction in order to maintain and improve organizational performance. It is important to recognize that the factors affecting job satisfaction may have changed due to the significant impact of the COVID-19 pandemic on people's lives. This study can help managers to understand the motivation factors that may increase employee job satisfaction and thus contribute to organizational growth in the post-COVID-19 pandemic era.

In terms of practical implication, this study provides valuable insights into how organizations enhance employee motivation and job satisfaction to improve organizational performance. Given the significant impact of the COVID-19 pandemic on people's lives, it is crucial to recognize that the factors influencing job satisfaction may have undergone changes. Therefore, our study offers a fresh perspective on the correlation between motivation factors and job satisfaction in the post-COVID-19 pandemic era. By understanding the motivation factors that can increase employee job satisfaction, managers can effectively contribute to organizational growth. Therefore, managers need to monitor employee satisfaction in the context of hygiene factors to avoid dissatisfaction. Providing safe working conditions and job security is essential to meet the basic needs of employees. This can lead to improved organizational performance, increase competitiveness, and talent retention. However, meeting hygiene factors alone is not enough to motivate employees and enhance job satisfaction. Our findings demonstrate that achievement, work itself, and recognition affected employees' job satisfaction. Organizations must also provide their employees with motivational factors that drive employee satisfaction and motivation. For instance, providing employees with challenging projects and opportunities for professional growth can help enhance their motivation and job satisfaction.

5.2 Limitation and Future Research

It is important to note the limitations in our study. The first limitation pertains to the small sample size utilized during data collection. The second limitation of study is the focus on employee perspectives only as reported in the survey questionnaire, without taking into account the employer or management perspective. To gain a better understanding of organizational constraints that impact employee motivation and job satisfaction, it is essential to include the viewpoints of employers and management in future research. To effectively manage employee motivation and job satisfaction in the engineering industry, future research should explore ways to incorporate a management perspective. The third limitation is quantitative method used in the study. Quantitative research is primarily concerned with objective measurement and statistical relationship. It may not adequately capture subjective experiences emotions and personal perspectives that are important in understanding certain research topics.

CONFLICT OF INTEREST

The author(s), as noted, certify that they have NO affiliations with or involvement in any organisation or agency with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, jobs, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, expertise or beliefs) in the subject matter or materials addressed in this manuscript.

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